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Perchlorate Occurrence in Ventura and Los Angeles Counties

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Welcome and Overview
Stephen Cain

- **Introductions**
- **Purpose and Organization of Presentation**
- **Information Resources**
- **Guidelines**

The Regional Board and Its Response to Perchlorate

The Regional Board and Its Response to Perchlorate

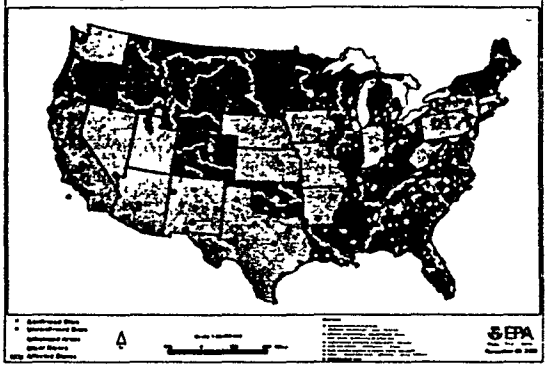
- Regional Board's Mission and Jurisdiction
- Lead Agency Designation for Perchlorate Investigation
- Perchlorate as a Substance of Regional Concern
- Overview of Regional Board's Response to Detection of Perchlorate in Surface Runoff and Groundwater

Perchlorate and Its Occurrence

Perchlorate and Its Occurrence

- Perchlorate has been found in many locations across the United States
- A major source of perchlorate is the Kerr-McGee facility in Henderson, Nevada
  - contamination has found its way to Lake Mead
  - contamination is in Colorado River water
- Most local sources of perchlorate are associated with aerospace development activity

U.S. Perchlorate Releases



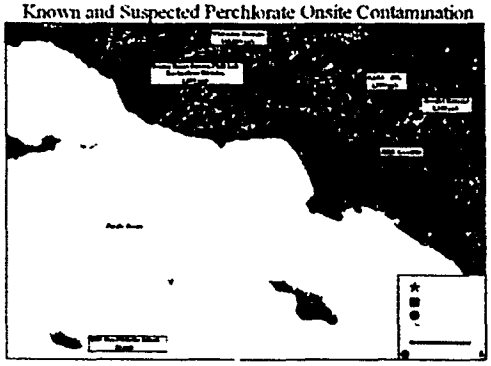
Perchlorate and Its Occurrence

- Possible Perchlorate Sources
  - Occurrence closely associated with aerospace and defense sites
  - Primary contamination most likely from "legacy" sources
  - Incidental and localized contamination may be from a variety of sources (e.g., fireworks, road flares, fertilizers)

Groundwater and Perchlorate: Los Angeles Region

- **Maximum reported concentrations in groundwater associated with aerospace and defense sites**
  - Aerojet (Baldwin Park) 2,180 ppb
  - NASA JPL (Pasadena) 1,500 ppb
  - Santa Susana Field Lab (Simi Valley) 1,600 ppb
  - US Naval Facility (San Nicholas Island) 16 ppb
  - Whittaker Bermite (Santa Clarita) 310,000 ppb

Known and Suspected Perchlorate Onsite Contamination



Groundwater and Perchlorate: Los Angeles Region

- Central Basin
  - sporadic detections in the Cities of Vernon, Commerce, Norwalk and Bellflower
- San Gabriel Basin
  - basin-wide detections, inside and outside designated Superfund areas
- Pomona Valley
  - detection in 23 production wells in the City of Pomona

Groundwater and Perchlorate: Simi Valley

- Simi Valley
  - 66 wells sampled
  - no perchlorate found in any Simi Valley drinking water well or source

Groundwater and Perchlorate: Simi Valley

- Of the 66 wells sampled
  - perchlorate detected in 17 groundwater samples
    - majority of detections at depths of less than 20 feet
  - all detections less than 20 ppb
  - 7 detections less than 6 ppb
  - California Public Health Goal: 2-6 ppb

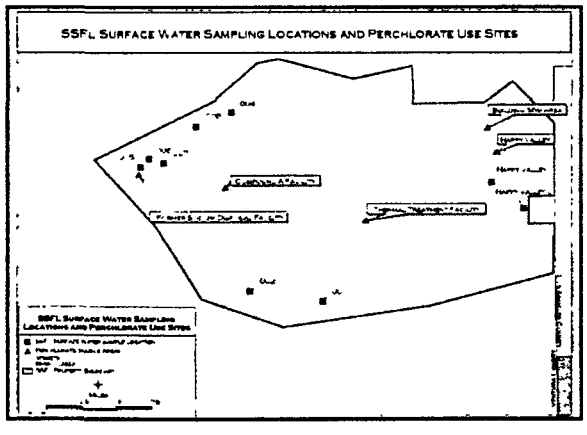
Groundwater and Perchlorate: Simi Valley

- Perchlorate is present in groundwater but single or multiple source(s) not confirmed
  - current data show no definable plume of contamination
  - at present, no confirmed connection to SSFL as the source
  - SSFL not ruled out as the source
  - supplemental re-sampling of 8 wells by Regional Board and DTSC (July, 2003)

Perchlorate and the Santa Susana Field Lab (SSFL)

SSFL Groundwater Contamination

- **Santa Susana Field Laboratory (SSFL)**
  - more the 880 groundwater samples at or near SSFL
  - approximately 20% of samples detected perchlorate
  - majority of detections located on-site in known areas of perchlorate use/destruction
  - single off-site detection at 4-6 ppb
    - Meier Canyon
    - not replicated
  - not detected in on- or off-site seeps or springs



Sites of Perchlorate Use With Contamination in Groundwater

- **Contamination Sites and Concentrations**
  - Building 359 area
    - 180 ppb
    - Chatsworth Formation Well HAR-25
  - Happy Valley area
    - 280 ppb
    - Chatsworth Formation Well RD-10 (231'-241' below ground surface)
  - Former Sodium Disposal Facility area
    - 8.3 ppb
    - Shallow alluvial aquifer well RS-54

Sites of Perchlorate Use with No Contamination in Groundwater

- Compound A Facility
  - Testing automobile airbag components
  - No record of actual perchlorate usage
  - Possible presence of perchlorate in explosives
  - No detection in groundwater
- Thermal Treatment Facility
  - Burning of liquid fuels, solvents and solid propellants in steel basin within steel cage covered with densely woven steel mesh
  - Approximately 1,890 pounds of perchlorate burned (1960-1990)
  - No detection in groundwater

Soils and Perchlorate: SSFL

- Santa Susana Field Laboratory
  - more than 450 soil samples at or near SSFL
  - approximately 25% of samples detected perchlorate
  - majority located on-site in known areas of perchlorate use/destruction

Soils and Perchlorate: SSFL

- **Contaminated Areas and Maximum Concentrations**
  - Building 359 area
    - 71,290 ppb, near bulk material storage and handling facility
    - No cleanup to date, but characterization ongoing under DTSC
    - Storm water runoff directed to Perimeter and R1 Ponds, then discharged at Outfalls 1 and 2 Perchlorate not detected in 72 samples between 1998 and 2002
  - Happy Valley area
    - 100 ppb near test building 372
  - Former Sodium Disposal Facility area
    - 1,300 ppb (prior to remedial action)
    - not detectable (after remedial action)

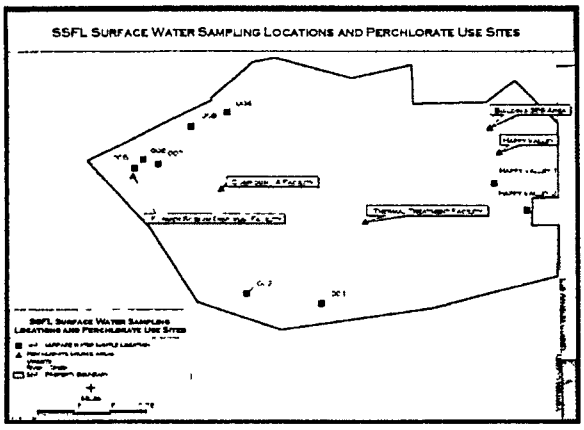
Soils and Perchlorate: SSFL

- Known Areas of Perchlorate Use/Destruction ***Without*** Perchlorate Contamination in Soil
  - Compound A Facility
    - Testing of automobile airbag components
    - No record of actual perchlorate usage
    - Possible presence of perchlorate in explosives
    - Not detected in soil
- Known Areas of Perchlorate Destruction
  - Thermal Treatment Area
    - Burning of liquid fuels, solvents and solid propellants in steel basin within steel cage covered with densely woven steel mesh
    - Approximately 1,890 pounds of perchlorate burned (1960-1990)
    - Removal of 1,800 cy's of contaminated debris and soils (1982)
    - Additional characterization to proceed within one year

Soils and Perchlorate: Land Adjacent to SSFL

- Numerous samples from canyons and drainage channels located in the undeveloped areas surrounding SSFL
- One sample collected from Meier Canyon (north side of SSFL) had reported detection of 4.6 ppb
  - Meier Canyon detection could not be duplicated following re-analysis of 60 pounds of soils from same location
- Regional Board soil/sediment samples from Chatsworth Reservoir and Dayton Canyon Creek
  - 2 Chatsworth and 1 Dayton Canyon Creek Samples (March 2003)
  - No perchlorate detected

SSFL Surface Water Runoff Discharge Permit



Surface Water: Current Permit Requirements for SSFL

- Effluent limits for chemicals of concern in wastewater and storm water discharges
- No current effluent limit for perchlorate
- Monitoring for priority pollutants in wastewater
- Monitor storm water only discharges for perchlorate.

Surface Water and Perchlorate: Concentrations in Storm Water at SSFL

- Sampling for perchlorate in storm water was initiated in January 1998
- 256 samples have been evaluated for perchlorate
- One detection in Outfall 006 of 4 26 ppb on May 5, 1998
- Happy Valley Data

Surface Water and Perchlorate: Concentrations in Storm Water at SSFL

Happy Valley (ppb)

Date	Result	Date	Result	Date	Result
3 25/98	20	1/12/01	8	2/12/03	4.7 (HV #1)
5/5/98	35 1	2/13/01	5 5	2/12/03	<4 (HV #2)
5 14/98	28 3	2/26/01	4.2	2/14/03	<4 (HV #1)
2/21/00	16	3/5/01	5.3	2/14/03	<4 (HV#2)
2/23/00	13	3/7/01	4 9	2/25/03	12 (HV #1)
3/9/00	17	3/8/01	5 2	2/25/03	<4 (HV#2)
3/11/00	8 2	3/9/01	4 8	3/15/03	5.3 (HV #1)
4/18 00	9 4			3/15/03	<4 (HV #2)

Surface Water : Tentative Permit Requirements for SSFL

- All discharges from a facility are required to be regulated under a permit issued by the Regional Board
  - Wastewater and storm water runoff is permitted from SSFL
  - current SSFL permit is scheduled for Regional Board consideration in August
  - proposed permit will include requirements for perchlorate monitoring and discharge limits
    - exact limits to be set by the Regional Board after a public hearing

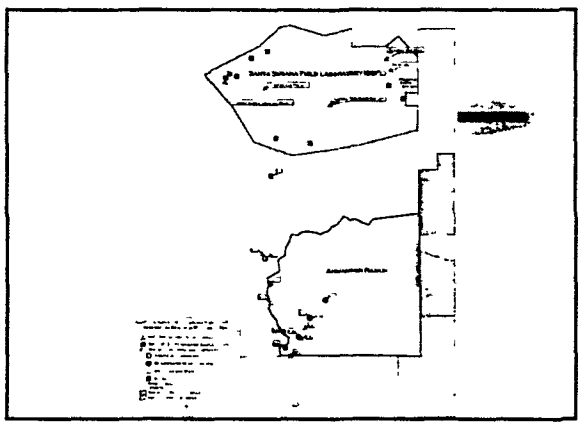
Surface Water: Tentative Permit Requirements for SSFL

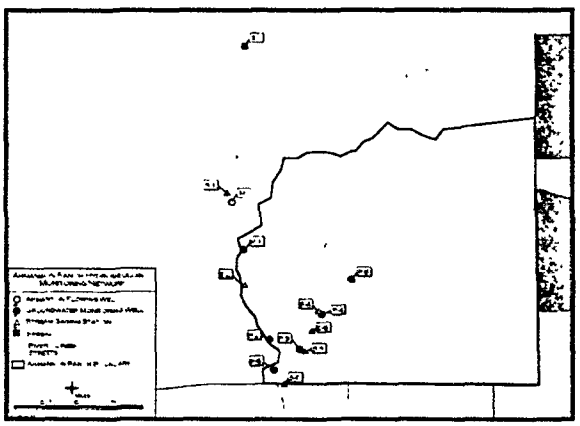
- CTR-based effluent limits for waste water discharges
- CTR-based daily maximum effluent limits for storm water only
- New effluent limit for perchlorate based on the most recent DHS Action Level
- A requirement for monitoring of "emerging" chemicals

Ahmanson Ranch MW-1

Ahmanson Ranch Water Quality Sampling

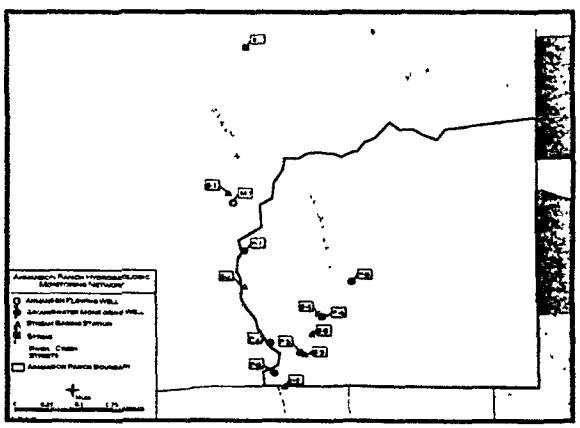
- Shallow Groundwater and Surface Water Sampling
  - November 2002
    - 6 shallow wells samples (P-1 through P-6)
    - 4 surface water samples (S-1 S-2 S-4 and S-6)
    - perchlorate ***not*** detected in any sample
  - March 2003
    - 6 shallow well samples (P-1 through P-6)
    - 6 surface water samples (S-1 through S-6)
    - perchlorate ***not*** detected in any sample





Ahmanson Ranch Water Quality Sampling

- Deep Groundwater Sampling (MW-1)
  - July 3, 2002 at 550 feet (Ahmanson Ranch Company)
  - August 1, 2002 at 450 and 550 feet (Ahmanson Ranch Company)
  - August 1, 2002 at 50, 450 and 550 feet (Ventura Co. Planning Department)
  - Single detection at 550 feet (28 ppb)
    - Ventura Co. Planning Department
    - Separate sample taken same day/depth showed non-detect for perchlorate



Ahmanson Well (MW-1) Re-Testing

- Regional Board staff approved a plan to retest Ahmanson Well #1 (April 23, 2003)
  - new data due June 13, 2003
  - blind samples will be used
  - "library" samples will be used
  - independent laboratory will be used
  - two discrete sampling events, multiple samples
  - intention is to validate the presence of perchlorate

Laboratory Testing for Perchlorate in Groundwater

- US EPA Test Method 314 0 is used to Determine Perchlorate Contamination
  - Method can be used for analysis of surface water, groundwater, and finished drinking water using ion chromatography
  - Sample holding time 28-days with no preservation required
  - Matrix interference from common anions (e g chloride, sulfate, and carbonate) in water samples
  - Samples that contain high levels of conductivity require pretreatment and dilution
  - Interference due to matrix differences and testing equipment can occur and result in higher detection limits, above 4 ppb, and potentially false positive in test results

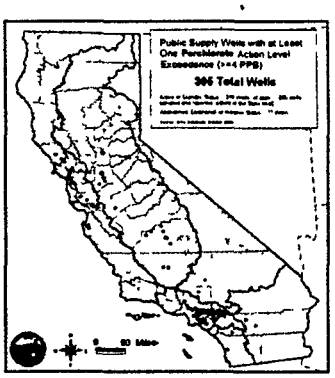
Drinking Water and Perchlorate

Drinking Water Wells and Perchlorate. State of California

- No Federal or State Maximum Contaminant Level (MCL)
- CA Dept of Health Services
  - to adopt State MCL by January 2004
- CA Dept of Health Services Action Level
  - 4ppb
- CA Dept of Health Services Detection (Reporting) Limit
  - 4ppb

Drinking Water Wells and Perchlorate: State of California

- Number of Drinking Water Sources with Detections
  - CA Dept of Health Services (April, 2003)
  - 315 of approximately 4,000 sources with detections
  - Top three counties with drinking water source contamination
    - Los Angeles County (126)
    - San Bernardino County (78)
    - Riverside County (55)



Drinking Water Wells and Perchlorate: Los Angeles Region

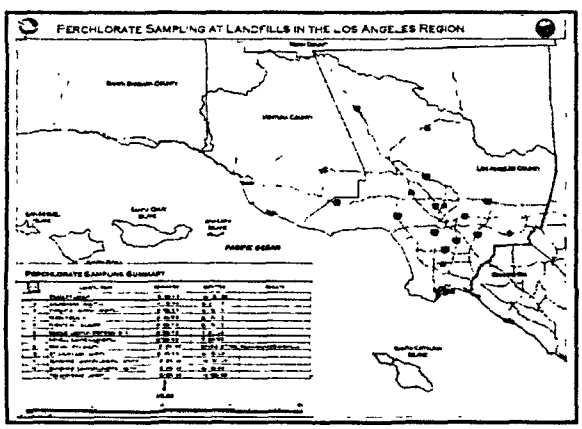
- Los Angeles County
  - 126 drinking water wells affected
  - 38 drinking water systems affected
- Ventura County
  - 2 drinking water wells impacted
  - Both drinking water wells on San Nicholas Island, operated by the US Navy

Drinking Water Wells Impacted by Perchlorate

Landfill Sampling

Detection of Perchlorate at Landfills

- **Simi Valley Landfill and Recycling Center**
  - Sampling Completed
  - Non-detect for Perchlorate
- **Calabasas Landfill**
  - Sampling currently underway
  - Results due June 2003
- **Bradley Landfill**
  - Sampling to be conducted at next quarterly sampling
  - Results due October 2003



Landfill Radioactivity Data

Landfill Radioactivity Sampling Results

Gross Alpha(MCL = 15 pCi/L)

Landfill Radioactivity Sampling Results

Gross Beta (MCL = 50 pCi/L)

Landfill Radioactivity Sampling Results

Tritium (MCL = 20,000 pCi/L)

Summary of Regional Board Actions

Regional Board Actions: Source Identification

- ***December 2002*** Regional Board issued investigation directive letter to Boeing (Santa Susana Field Lab)
- ***December 2002*** Regional Board issued investigation directive letter to Ahmanson Ranch to retest Well MW-1 (Workplan approved April 23, 2003)
- ***1st Quarter, 2003*** Regional Board staff sent out 433 letters to permit holders requesting a one time sampling for perchlorate and other compounds
  - Sporadic, low level concentrations (less than 35 ppb) found throughout region

Regional Board Actions: Current Action

- **Current Focus is on Investigation**
  - orders issued to determine extent of contamination
  - data still coming in and being reviewed
- **Drafting surface runoff permit for Regional Board consideration**
  - scheduled for Board action: August, 2003

Regional Board Action: Future Actions

- **Future Actions (definite)**
  - renew and update surface water runoff permit
  - increase source identification efforts
  - continue coordination with US/EPA and DTSC
- **Future Actions (potential)**
  - issue Cleanup and Abatement Orders if warranted
    - by the presence of significant contamination sources
    - by the confirmation of off-site groundwater contamination and cleanup is deemed necessary
  - enforce permit effluent limits if violations occur

Status Summary

Status Summary

- Perchlorate is a significant threat to surface and groundwater quality
- Perchlorate contamination has been found nationally and in many areas of the state
  - Contamination usually linked to sites associated with perchlorate use

Status Summary

- Perchlorate contamination has impacted 126 drinking water wells in Los Angeles County and 2 drinking water wells in Ventura County (both on San Nicholas Island)
- Perchlorate has ***not*** impacted drinking water wells in Simi Valley

Status Summary

- Suspected sources of perchlorate contamination in the Simi Valley area are being investigated
  - Connection between known and suspected sources of perchlorate and contaminated wells not yet established in Simi Valley/Ahmanson Well MW-1
- The Regional Board will continue to investigate possible contamination sources
- A new surface water runoff permit is forthcoming

Status Summary

- The Regional Board will continue to work with [redacted] state agencies, local governments and water providers to develop and implement assessment and remediation strategies
- The Regional Board welcomes community involvement in its efforts to identify and control perchlorate contaminated surface- and groundwater
  - Next Perchlorate Public Advisory Meeting May 23rd
  - Perchlorate Public Advisory Meeting in Ventura County being scheduled

Perchlorate Occurrence in Ventura and Los Angeles Counties

Public Comment

Please Submit Speaker Card or Written Question

Landfill Radioactivity Sampling Results

Gross Alpha(MCL = 15 pCi/L)

Landfill Name	Upgradient (ave)	Leachate (ave)	Downgradient (ave)
Bradley Landfill	6.5	4.18	10.3
Calabasas Landfill	40.7	52.6	24.1
Sunshine Canyon Landfill	1.98	1.7	3.45

Landfill Radioactivity Sampling Results

Gross Beta (MCL = 50 pCi/L)

Landfill Name	Upgradient (ave)	Leachate (ave)	Downgradient (ave)
Bradley Landfill	5.9	499.7	5.9
Calabasas Landfill	34.4	50.4	15.5
Sunshine Canyon Landfill	6.3	83.4	21.8

Landfill Radioactivity Sampling Results

Tritium (MCL = 20,000 pCi/L)

Landfill Name	Upgradient (ave)	Leachate (ave)	Downgradient (ave)
Bradley Landfill	ND	6,250	ND
Calabasas Landfill	ND	1,060	160
Sunshine Canyon Landfill	ND	29,255	ND